UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/591,122	06/09/2000	Joseph L. Hellerstein	YOR000146US1	3432

7590 08/24/2004	EXAMINER
William E Lewis	THANGAVELU, KANDASAMY

ART UNIT	PAPER NUMBER
2123	

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DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/591,122	HELLERSTEIN ET AL.
	Examiner	Art Unit
	Kandasamy Thangavelu	2123

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 May 2004</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-4,6-13 and 15-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-4,6-13 and 15-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>24 November 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Introduction

1.   This communication is in response to the Applicant's Response mailed on May 26, 2004. Claims 1, 10 and 19 were amended. Claims 5 and 14 were deleted. Claims 1-4, 6-13 and 15-20 of the application are pending. This office action is made final.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 1, 8-10 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by **Kim et al. (KI)** (U.S. Patent 5,793,429).

3.1   **KI** teaches methods of estimating motion in image data and apparatus for performing same. Specifically, as per Claim 1, **KI** teaches an apparatus for providing on-line adaptive predictions for use by one or more applications used in association with one or more operations for which predictions may be requested (CL4, L24-30; Fig 6; Fig 7-9);

the predictions being performed in accordance with at least one model which includes

one or more sub-models (CL3, L53-67; CL4, L27-48); the apparatus comprising:

at least one processor (Fig 6, Item 30);

operative to at least one of: (i) adapt at least one of the one or more sub-models (CL3,

L60-63; **KI** states that the 3-D spatial model includes multiple elementary models to effectively

treat motion discontinuity); and determine an optimum combination of sub-models (CL4, L54-

65; CL4, L27-30; **KI** states selecting the best model which yields the smallest sum of absolute

difference error); to be used in computing on-line predictions, when a change is detected in data

associated with the one or more operations for which predictions may be requested (CL4, L54-

65; CL4, L27-30); and

(ii) compute one or more predictions, in response to one or more requests from the one or

more applications, using the one or more sub-models determined to provide an optimum

prediction combination (CL4, L54-65; CL3, L53-67).

The examiner directs the Applicants' attention to the fact that while the applicant's claim

requires only one of (i) or (ii) above, the Examiner has shown that KI teaches both (i) and (ii).

3.2   As per claim 8, **KI** teaches the apparatus of Claim 1.   **KI** also teaches that the prediction

computing operation further comprises computing a prediction for each of the one or more

sub-models determined to provide the optimum prediction combination (CL4, L54-65; CL3,

L53-67).

3.3   As per claim 9, **KI** teaches the apparatus of Claim 8.   **KI** also teaches that the prediction

computing operation further comprises combining the results of the one or more computed

predictions (CL 3, L53-62).

3.4   As per Claims 10, it is rejected based on the same reasoning as Claim 1, <u>supra.</u>   Claim 10

is a method claim reciting the same limitations as Claim 1 above, as taught throughout by **KI**.

3.5   As per Claims 17 and 18, these are rejected based on the same reasoning as Claims 8 and

9, <u>supra.</u>   Claims 17 and 18 are method claims reciting the same limitations as Claims 8 and 9

above, as taught throughout by **KI**.

3.6   As per Claim 19, **KI** teaches an article of manufacture for providing on-line adaptive

predictions for use by one or more applications used in association with one or more operations

for which predictions may be requested (CL4, L24-30; Fig 6; Fig 7-9);

the predictions being performed in accordance with at least one model which includes

one or more sub-models (CL3, L53-67; CL4, L27-48); comprising a machine readable medium

containing one or more programs which when executed implement at least one of the steps of:

adapting at least one of the one or more sub-models (CL3, L60-63; **KI** states that the 3-D

spatial model includes multiple elementary models to effectively treat motion discontinuity);

and determining an optimum combination of sub-models (CL4, L54-65; CL4, L27-30; **KI** states

selecting the best model which yields the smallest sum of absolute difference error); to be used in

computing on-line predictions, when a change is detected in data associated with the one or more

operations for which predictions may be requested (CL4, L54-65; CL4, L27-30); and

computing one or more predictions, in response to one or more requests from the one or

more applications, using the one or more sub-models determined to provide an optimum

prediction combination (CL4, L54-65; CL3, L53-67).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

5.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

6.   Claims 2-3, 6-7, 11-12, 15-16 and 20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over **Kim et al. (KI)** (U.S. Patent 5,793,429) in view of **Hellerstein et al. (HE)**

(IEEE, May 1999).

6.1   As per claim 2, **KI** teaches the apparatus of Claim 1. **KI** does not expressly teach that

the adapting operation further comprises estimating one or more parameters associated with each

of the one or more sub-models based on data received with respect to the detected change. **HE**

teaches that the adapting operation further comprises estimating one or more parameters

associated with each of the one or more sub-models based on data received with respect to the

detected change (Page 311, Para 4 to Page 312, Para 2; Page 313, Para 3 to Page 314, Para 2), as

that enables predicting the time-varying or nonstationary behavior of the measurement variable

and the stationary, time-serial dependencies of the variable (Page 311, Para 4; Page 312, Para 2;

Page 314, Para 2). It would have been obvious to one of ordinary skill in the art at the time of

Applicants' invention to modify the apparatus of **KI** with the apparatus of **HE** that included the

adapting operation further comprising estimating one or more parameters associated with each of

the one or more sub-models based on data received with respect to the detected change, as that

would enable predicting the time-varying or nonstationary behavior of the measurement variable

and the stationary, time-serial dependencies of the variable.

6.2   As per claim 3, **KI** and **HE** teach the apparatus of Claim 2. **KI** does not expressly teach

that the one or more estimated parameters for a sub-model are used to update a descriptor

associated with the sub-model. **HE** teaches that the one or more estimated parameters for a

sub-model are used to update a descriptor associated with the sub-model (Page 312, Para 2; Page

314, Para 2), as that allows using appropriate model for predicting the time-varying or

nonstationary behavior of the measurement variable and the stationary, time-serial dependencies

of the variable (Page 311, Para 6; Page 312, Para 1 and 2; Page 314, Para 2). It would have been

obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the

apparatus of **KI** with the apparatus of **HE** that included the one or more estimated parameters for

a sub-model being used to update a descriptor associated with the sub-model, as that would allow

using appropriate model for predicting the time-varying or nonstationary behavior of the

measurement variable and the stationary, time-serial dependencies of the variable.

6.3   As per claim 6, **KI** teaches the apparatus of Claim 1.   **KI** does not expressly teach that a

sub-model maintains data used to estimate one or more parameters associated therewith. **HE**

teaches that a sub-model maintains data used to estimate one or more parameters associated

therewith (Page 311, Para 4 to Page 312, Para 2; Page 313, Para 3 to Page 314, Para 2), as that

enables predicting the time-varying or nonstationary behavior of the measurement variable and

the stationary, time-serial dependencies of the variable (Page 311, Para 4; Page 312, Para 2; Page

314, Para 2). It would have been obvious to one of ordinary skill in the art at the time of

Applicants' invention to modify the apparatus of **KI** with the apparatus of **HE** that included a

sub-model maintaining data used to estimate one or more parameters associated therewith, as

that would allow predicting the time-varying or nonstationary behavior of the measurement

variable and the stationary, time-serial dependencies of the variable.

6.4   As per claim 7, **KI** teaches the apparatus of Claim 1.   **KI** does not expressly teach that a

sub-model at least one of computes and stores one or more values associated with one or more

sub-model parameters. **HE** teaches that a sub-model at least one of computes and stores one or

more values associated with one or more sub-model parameters (Page 311, Para 4 to Page 312,

Para 2; Page 313, Para 3 to Page 314, Para 2), as that enables predicting the time-varying or

nonstationary behavior of the measurement variable and the stationary, time-serial dependencies

of the variable (Page 311, Para 4; Page 312, Para 2; Page 314, Para 2). It would have been

obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the

apparatus of **KI** with the apparatus of **HE** that included a sub-model at least one of computing

and storing one or more values associated with one or more sub-model parameters, as that would

allow predicting the time-varying or nonstationary behavior of the measurement variable and the

stationary, time-serial dependencies of the variable.

6.5   As per Claims 11-12 and 15-16, these are rejected based on the same reasoning as Claims

2-3 and 6-7, supra. Claims 11-12 and 15-16 are method claims reciting the same limitations as

Claims 2-3 and 6-7 above, as taught throughout by **KI** and **HE**.

6.6   As per Claim 20, this is rejected based on the same reasoning as Claim 6, supra. Claim

20 is an article of manufacture claim reciting the same limitations as Claim 6 above, as taught

throughout by **KI** and **HE**.

7.   Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kim et al. (KI)** (U.S. Patent 5,793,429) in view of **Hellerstein et al (HE)** (IEEE, May 1999), and further in view of **Hellerstein et al (HEL)** (1998 Conference of the computer measurement Group, December 1998).

7.1   As per claim 4, **KI** and **HE** teach the apparatus of Claim 2.   **KI** does not expressly teach the adapting operation further comprises testing for a change-point condition. **HEL** teaches the adapting operation further comprises testing for a change-point condition (Page 11, Para 6 to Page 12, Para 1), as that allows detection of anomalies, such as an increase in the mean or variance, using an on-line technique that examines the observations in sequence (Page 11, Para 6 to Page 12, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **KI** with the apparatus of **HEL** that included adapting operation further comprising testing for a change-point condition, as that would allow detection of anomalies, such as an increase in the mean or variance, using an on-line technique that examines the observations in sequence.

7.2   As per Claim 13, it is rejected based on the same reasoning as Claim 4, <u>supra.</u> Claim 13 is a method claim reciting the same limitations as Claim 4 above, as taught throughout by **KI, HE** and **HEL**.

Response to Arguments

8.   Applicant's arguments filed on May 26, 2004 have been fully considered. Applicant's

arguments filed on May 26, 2004 under 35 U.S.C. 102 (e) and 103 (a) are not persuasive.

8.1   As per the applicants' argument that "Kim fails to disclose the determination of an

optimum combination of sub-models to be used in computing on-line predictions, when a change

is detected in data associated with the one or more operations for which predictions may be

requested; and Kim fails to disclose the computation of one or more predictions using the

optimum prediction combination of sub-models", the examiner respectfully disagrees. Kim

teaches selecting the best (optimum) model which yields the smallest sum of absolute difference

error (CL4, L56-58), where each model includes multiple elementary models (a combination of

sub-models) (CL3, L60-62). It would have been obvious to one of ordinary skill in the art that

Kim teaches selecting an optimal combination of sub-models.

Conclusion

ACTION IS FINAL

9.   Applicant's arguments with respect to claim rejections under 35 USC § 102 (b) and 103

(a) are not persuasive. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37
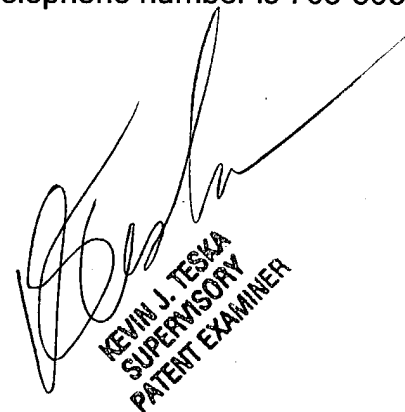
CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is

703-305-0043. The examiner can normally be reached on Monday through Friday from

8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

9600.

K. Thangavelu
Art Unit 2123
August 12, 2004